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This report is one of 79 in a volume dealing with the new economic order taking shape on American farms, in rural America, and in cities. It focuses on the role of education at all levels to meet the needs of the rural population and indicates directions in which curricular revisions are taking place in agricultural colleges.

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HENRY S. BRUNNER

EDUCATIONAL OPPORTUNITIES FOR ALL

AN EXPECTED increase of 30 percent in high school enrollment and 70 percent in college enrollment in the next years threatens a shortage of classrooms, facilities, and qualified teachers. Make no mistake about the seriousness of the situation: If we are to achieve our long-run national goals, we must make strenuous efforts immediately to plan and finance the costs of construction and operation and to train teachers required for the increases in demand for education.

The challenge applies to all of the United States, but it has special significance for rural districts.

It is not only a matter of population figures, such as those that indicate the number of high school students is growing from 6.5 million to nearly 14 million and the number of college students from 2.7 million to 6.4 million in 1950–1970.

Rather, there are questions and issues that census data are not intended to include, much less to solve. These are qualitative questions—questions about whether the educational system and the educational plant are administered in a way that encourages the people to use them; whether the teaching in the system is of the kind that promotes the fullest development of the intellect with which each student is endowed; and whether the administration and the teaching combine to provide effective and continuing preparation for the life and the kind of living the students are likely to face in their—each his own—world.

The effectiveness and therefore the adequacy of a school or school system rests on the quality of the teachers. Good education results when schools have competent and insightful teachers, men and women who are broadly educated, interested in young people, familiar with the processes of human growth and development, professionally trained in the science and art of teaching, and thoroughly grounded in the common as well as their own specialized learnings.

The better qualified teachers generally are in the larger school districts, partly—but only partly—because salaries are better. They do not remain in

the smaller rural districts although they may start their teaching careers there. I cite the teachers of English as an example because all schools offer courses in English.

Studies in Michigan, Virginia, and Ohio disclosed a positive relationship between the size of the school community and the percentage of English teachers holding advanced degrees, the length of the English teachers' experience, and the number of hours of English training its teachers have had.

Those who made the study in Virginia concluded: "The fact must be faced that the education of our children suffers because of three effects which inadequate salaries have upon the teaching profession: They cause many good teachers to seek employment in more remunerative positions in business; they pose a problem of morale with those who remain in the teaching ranks; and they are very definitely a hindrance in the recruitment of the more intelligent high school and college graduates for teaching. . . ."

Dr. Donald R. Tuttle, Specialist for College English in the United States Office of Education, in a statement to support the quality education bill, said: "The English teachers in rural and village areas usually have less preparation in academic subjects . . . often have no person who knows more in their field than they do to supervise their efforts . . . have no school or village libraries with the kind of books they need to better themselves . . . and salaries so low they cannot afford to buy these books themselves. . . . Because of the small size of the school, they have to teach as many as three different subjects and consequently have more preparations to make than the teachers in larger schools. . . . Scholarships to in-service institutes, money for libraries, money for qualified supervisors, and money for research in ways of meeting their needs could do much to assist the rural teachers."

For teachers of agriculture, the captions of an exhibit on teacher education in agriculture prepared for a national meeting of the American Vocational Association set forth several standards:

"The teacher must have a desire to teach, a willingness to work, an appreciation of scholarship, a concept of the individual, a sympathetic personality, a love for rural life, a sense of moral responsibility, a commitment to the ideals of freedom.

"The teacher must know the basic principles of science, soils and fertility, feeds and feeding, culture of crops, the livestock diseases—prevention and treatment, market demands—quality the products, management practices, budgetary analysis and financing, conservation procedures, machinery selection and maintenance, farm structures needs, leadership and citizenship qualities, the place of agriculture in the world economy.

"The teacher must understand how pupils learn, the techniques that facilitate learning, the worth of the individual and the family as a unit, the importance of encouragement, the influence of enthusiasm, youth's need for love, and the power of the spirit."

Serious attention to the proper preparation and competence of teachers in all fields might well be the most important effort that could be made to improve the adequacy of rural schools in fulfillment of the function of preparing youth for productive lives.

WE FIND evidence in census data that rural farm and rural nonfarm groups have less formal education than city people. Furthermore, although we can cite cases of young workers who have less than high school education but successfully enter the professions or become skilled workers, the level of jobs workers hold is strongly related to the amount of education they have. Young workers increasingly are expected to have at least a high school diploma; college training is necessary for many positions.

The 1950 census revealed that 49.8 percent of the urban population 25

years old and over and 43.4 percent of the rural population of the same age had completed at least the elementary grades. Only 19.2 percent of the city people did not continue beyond the eighth grade, 23.2 percent completed high school, and 7.4 percent completed 4 or more years of college. Of the rural population, 24 percent of the total did not go beyond the eighth grade, 15.7 percent completed high school, and 3.7 percent completed 4 years or more of college.

The 1960 census showed higher levels of educational attainment. Of city people 25 years old and over, 16.3 percent terminated their education with the eighth elementary grade, 25.7 percent completed high school, and 8.9 percent completed 4 or more years of college. In the rural group, the proportion terminating with the elementary grades was 20.6 percent, 21.9 percent completed high school, and 4.7 percent completed 4 or more years of college.

While the percentages of the people 25 years old and over attaining the different levels of education remained less in the rural segment than in the urban segment of the total population, the relative increases of the rural group at both the high school and the college level were greater than those in the urban group.

The remarkable increase occurred in the rural group at the high school attainment level—that is, 21.9 percent of the people 25 years old and over in the rural group had completed high school in 1960, compared to 15.7 percent in 1950, an increase of 39.5 percent in the proportion.

More detailed tabulations of the census data may show that a considerable part of this increase was in the nonfarm rather than in the farm part of the rural group. That, however, would not gainsay that the rural high schools are serving greater numbers and increasingly larger proportions of the people in their communities.

In this connection we must consider all the selective factors of migration, which include age, sex, family and economic status, psychophysical status, and intellectual performance.

Most of the migrants are 15 to 25 years old. The ones who move to cities tend to be more intelligent and to have superior school aptitudes. This factor may have a bearing on the census data that show a larger proportion of the rural than of the urban population 25 years old and over with less than five grades of schooling. It means that older persons who remain in rural communities include the people with lower school aptitudes. Furthermore, they were of a generation and a time when schooling was not expected of everyone, much less considered essential to success.

We should remember, too, that these older people are exercising the usual parental influence on their sons and daughters. Many surveys have shown that the influence of parents is the greatest single explanation of why boys and girls finish high school and go to college. Cumulatively, then, rural young people undoubtedly receive less encouragement and are subject to less insistence toward any higher educational attainment than is convenient.

Recognizing the conditions that operate to the disadvantage of rural and farm youths in the matter of education, and therefore in the matter of competition for city jobs, we should give attention to marshaling all possible educational and social forces to correct the disadvantage.

It is wrong to attribute the rural-urban differences to innate differences in intellectual ability or other potentials in the boys and girls. A broad educational effort in the schools, with the parents, and with the social organizations in the rural communities can do much to improve the situation.

For youths and adults who are out of school and need and want more education or specific preparation for a job, a program of continuing education—to include special day or evening classes in general education or in skills re-

quired for employment and to be administered by the local schools or a college—may fill the need.

Many of us do not understand or utilize the opportunities offered in correspondence or home study courses. The optional educational and training programs of the military services are based largely on these courses. Great numbers of workers in business and industry, including engineers and technicians, keep themselves up to date in this way. Many teachers take this way to meet certification standards. School systems in rural communities could greatly increase the scope and variety of their offerings to meet individual needs by offering such courses.

Teachers of vocational agriculture in nearly 10 thousand rural high schools know that only about half of the boys in their classes will have a chance to farm. They know also that those who do get into farming need a broad understanding of agricultural science and technology and a knowledge of management and financial practice in order to operate large units. In most cases, either as State policy or in local practice, the content of the courses and instructional plans have been adapted to those needs.

They have realized that the traditional program of how-to-do-it training for farming would not entirely suit the needs of the boys who would go out into nonfarming occupations but that many of these occupations would be closely related to the lives of farmers and to the business elements of farm production. It has been possible, with this in mind, to change the approach to agricultural technology, sometimes for an individual, sometimes for a small group within a class.

California provides an example of the movement toward teaching the fundamental principles of the sciences on which agriculture is based. There the teacher education division of the University of California at Davis, in cooperation with members of the staff of the California State Department of Education, have developed and used experimentally in selected high schools an agricultural course of study built around the basic principles of biological science: "All things, living and nonliving, are either matter, energy, or a combination of matter and energy," or "The basis of classification of living organisms is the similarity of structure and function," or "All organisms derive the energy required for their processes and activities from the oxidation of simple foods within their protoplasm."

This plan requires a change in emphasis in teaching—a shift from the *product* of science to the *process* of science, but is entirely in keeping with the science-oriented base on which our society seems to be moving. The students in this plan should come to an understanding of the interrelationships of biology, mathematics, physics, and chemistry and be conditioned for similar interrelations in the sociological and economic areas of life.

A study in Illinois of future plans of high school seniors in vocational agriculture disclosed that 44.4 percent planned to enter farming, 32.2 percent had plans for further education, and 18.2 percent were going into nonagricultural occupations. The others were undecided. A higher percentage of boys with 3 or 4 years of vocational agriculture registered for further education than did those with only 1 or 2 years of vocational agriculture, and 61 percent of the college-bound seniors planned to study agriculture.

Many other studies in nearly every State have found that boys who studied vocational agriculture in high school and went on to college performed just as well as their counterparts from other high school programs in general college work and better in agricultural courses.

The difficulty often encountered in admission to college on account of requirements in mathematics has been greatly alleviated by a policy in many high schools of providing for program adjustments that allow the boys who know they are going to college to take the necessary mathematics along with vocational agriculture.

In a study in Ohio, the findings indicate that employers emphasize personal characteristics—honesty, initiative, ambition, cooperation, neatness, cleanliness, dependability, willingness to work, ability to work with others, commonsense, responsibility, and good moral character.

I think those characteristics can be acquired in a rural school perhaps better than in a large city school, because the teacher-pupil relationships are more personal in the smaller school and there is greater opportunity for involvement in the activities of school life.

The habits developed in the required work experience and the general knowledge of modern machinery are attributes cited by many employers as desirable characteristics of graduates of vocational agriculture high schools.

Another notable emphasis that has developed in the vocational agriculture program is the attention given to leadership activities. Abilities in communication—in speaking and writing—and practice in the organization of groups are a recognized part of the learning activities. This training will serve both the boys who get into farming and rural living as well as those who go into other occupations, whether in country or city surroundings.

Consideration has been given therefore to boys in high school vocational agriculture who will find themselves in occupations other than farming—those who go on to college and those who go into the branches of industry related to agriculture. Thus it is likely that the teachers are providing for these boys a kind of vocational training that they could not get in any other way in the rural schools.

Vocational agriculture is only one part of the broad vocational education offerings in 17 thousand schools and other institutions. There are nearly 2 thousand comparable programs of training for trades and industry, 1,300 programs of training for distributive occupations, and more than 11 thousand home economics programs.

The availability of training centers

and their flexibility of organization make it possible to initiate or adjust training programs to meet national, State, and local needs. Important contributions to the training of manpower for the work force have been made by private as well as public institutions.

I LIST some of the principles that can guide the development and operation of vocational education programs.

The need for training is determined by school officials and competent individuals and groups representing the occupations for which training is to be provided.

The content of programs and courses is based on an initial analysis of an occupation and a periodic reanalysis and reappraisal of training needs.

Courses and programs for an occupation are designed and maintained with the advice and cooperation of representatives from the occupational field. The facilities and equipment used in instruction are comparable to those found in the occupation.

Training in a particular occupation is carried to the point of developing marketable skills and other job assets to enable students to succeed in initial employment in this occupation and to give them a basis for further education and advancement.

The principle that one learns to do by doing is applied in all phases of vocational education in order to bridge the gap between the school and the work situation.

COURSES FOR employed workers in an occupation usually take the form of short units of instruction designed to develop specific areas of skill for updating or upgrading training. Efforts are made to provide this type of training in the amount needed to meet the worker's needs at a time and a place convenient to him.

Programs of public vocational and technical education are carried on with Federal aid in regular high schools or technical or vocational high schools. They are designed primarily for students 14 to 18 years old and within the last 4 years of the typical 12-year program of public education. It is not uncommon, however, for older persons to be enrolled for preparatory training in some of these schools. The facilities of the schools are used not only for daytime preparatory training but also for evening courses for employed workers who wish to improve their competency.

An increasing number of post-high-school vocational and technical education programs are offered in public community colleges, junior colleges, technical institutes, and area vocational schools, designed entirely or partly to meet the preparatory training needs of persons who have completed the normal 12 years of public education and of others who are beyond the age of the group usually enrolled in the 12-year public education program. Their programs usually involve 2 years of training and lead to immediate employment. They reflect a growing trend of public vocational education for older students and also provide facilities for training adult employed workers.

Area vocational schools have received increasing attention and emphasis. Their purpose is to serve young people and adults within a rather large geographical area. The goal is the development of enough of these schools to give to capable students throughout the Nation the opportunity to get the vocational training they think they need.

The land-grant colleges in fulfillment of their function as "the people's colleges" have been giving particular attention to the place of rural youth in our society. In many States they have conducted organized recruitment and counseling programs in rural high schools. The agricultural colleges are adjusting to the fact that career opportunities for the graduates are no longer dominantly in farming. About 15 percent of the graduates from these colleges go into farming each year.

A study at Cornell University of the graduates with baccalaureate degrees from the College of Agriculture in 1956–1960 found 18 percent of the graduates had gone into farming and farm management; 15 percent into agricultural conservation, research, teaching, and services; 20 percent into agricultural business; 38 percent into graduate or professional study; and 9 percent in nonagricultural occupations.

A committee of the American Society of Agronomists gathered data on the first occupations of baccalaureate-degree graduates from the different curriculums in agronomy for the United States during the 5 years from 1957 to 1962. The study included those who had gone into military service (524) and an "unknown" category (259), representing together about one-fifth of the total of 3,640 graduates. Of the other 2,857 4-year graduates, 18 percent, exactly the same proportion as in the Cornell study, had gone into farming and farm management; 33 percent into publicly supported agricultural occupations; 18 percent into agricultural business, industry, and communications; 26 percent into graduate study; and 5 percent into nonagricultural situations.

The two studies are examples of the efforts administrators and faculties of the agricultural colleges are making to

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review and revise their aims and curriculums to meet present and prospective needs. There is general agreement among them that agriculture in our present economy must be looked upon and understood as a broad and complicated industry concerned with producing, processing, and distributing food and fiber for the United States and many other countries. Agriculture therefore needs trained youths who can work in a variety of situations and under different conditions. We look to the agricultural colleges to produce graduates equipped to adjust themselves to new ideas, handle a variety of problems, and meet unpredictable situations in on-the-farm and off-the-farm enterprises.

Curriculums are being revised in various ways. The direction has been toward a broader base, with emphasis on the basic sciences and on an understanding of the sociological and economic interrelationships of the agricultural industry with the other forces in the modern world.

Guidelines for many of the changes were given by the Committee on Educational Policy in Agriculture of the Agriculture Board in the National Academy of Sciences-National Research Council.

The Committee recommended, "as a basis for attaining the status of Bachelor of Science in Agriculture," a course requiring (when the total required for graduation is 130 credit-hours): General education, 65 credit-hours (comprising communications, 12 credits; humanities and social sciences, 18; mathematics and statistics, 9; physical sciences, 12; and biological sciences, 14 credits); major field, 26 credits; supporting courses to major field, 26 credits; and electives, 13 credits. The proportions should be the same, whether the student's area of concentration is in agricultural sciences, agricultural production, or agricultural business.

The recommendation concluded: "The Committee wishes to point out that many colleges of agriculture are now offering this type of program. The importance of this 'suggested minimum' is not that the institutional leadership is unaware of the need for a strong background in the basic sciences, humanities, etc., but that the public does not realize that agriculture colleges now offer such curricula. . . . It is the hope of this Committee that the Agricultural Board will encourage the dissemination of this information in such a way that it will help inform persons interested in the final product of agricultural colleges that there is science in agriculture, that agriculture is science."

Recognition has grown of the need to have some knowledge of business, whether to prepare for the management of a farming operation or for responsibility in an industrial organization related to agriculture.

Some institutions have a specialized agricultural business curriculum, usually offered in the department of agricultural economics and using courses from the college of business administration on a service basis. The curriculum in others is administered jointly by the college of agriculture and the college of business administration. The most significant pattern seems to be the offering of options, usually three, called business, production (or technology), and science, in each of the established departments.

All this points to a curriculum that encourages training in the scientific disciplines, a knowledge of the application of scientific principles to agriculture, something of a background in the humanities, and an opportunity for the student to think for himself.

A MAJOR question in education is how to acquaint students of all ages with the opportunities they have in occupations and careers. Effective guidance services have been set up in many schools, but not in all.

In public schools enrolling more than 50 thousand pupils, there were four times as many organized guidance programs in 1962 as there were in

1959, but only twice as many in schools of fewer than 5 thousand. The small school units of fewer than 100 pupils had 204 guidance programs in 1959 and 208 in 1962.

The discrepancy is all the more regrettable because the advice of experienced counselors about the shift in our occupational distribution from goods-producing activities to service-producing activities is needed more by rural young people than by city students, who are closer to the factories and offices that some day may hire them.

Counseling can be done by everyone qualified to contribute. Teachers of vocational agriculture and extension workers are among those who can give boys, girls, and parents a greater appreciation of the importance of education and proper preparation for an occupation. To do this effectively, however, the teachers themselves must be properly informed as to the requirements for different kinds of jobs and have a keen awareness of the economic, sociological, and all cultural interrelationships among all fields of study.

Young people are being urged by leaders in industry and education to get a broad training in English, basic science, and mathematics. Their arguments are similar, regardless of their vocation. Some suggest that all early training should be basic and that undergraduate work in college should be in the liberal arts, with any form of specialization left for graduate study.

The concern of the Federal Government for the education of all citizens has been well established. Support to the States for schools, at first in the form of grants of public lands, dates from 1787. A notable action was the Morrill Act of 1862, which provided the basis for the establishment of colleges in which instruction in agriculture and the mechanic arts ("not to the exclusion of other subjects") should be offered.

These colleges, now 67 in number, with at least one in each State, generally are known as the land-grant college system. They enroll about one-fifth of the Nation's college students and in 1961 granted nearly one-third of the baccalaureate degrees, two-fifths of all master's degrees, and more than one-half of the doctorates granted in the United States.

Provision for carrying instruction from these colleges to adults and young out-of-school groups was made in the Smith-Lever Act of 1914, broadened in its scope by amendments through the years, the latest in 1955.

In 1917 the Congress passed the Smith-Hughes Act providing for vocational education in agriculture, trade and industry, and home economics in the secondary schools. The George-Barden Act of 1946 augmented and broadened this secondary school program to include preparation for the distributive occupations.

The National Defense Education Act of 1958 included titles authorizing support for loans to college students; strengthening instruction in science, mathematics, and modern foreign languages; graduate fellowships; guidance, counseling and testing; language development; research and experimentation in new educational media; and area vocational schools.

There is also important Federal support for education in the field of medicine and health through the National Institutes of Health, for all fields of science through the National Science Foundation, and for many specialized programs, such as education for the blind, police training schools, and war orphans education.

The 87th Congress enacted the Area Redevelopment Act of 1961 (Public Law 87-27) and the Manpower Development and Training Act of 1962.

The former included provision for support of programs "to meet occupational training or retraining needs . . . for those unemployed or underemployed individuals (in the areas designated as redevelopment areas) who can reasonably be expected to obtain employment as a result of the skill which they will acquire in the training which is to be made available."

The stated purpose of the second act is to "promote and encourage the development of broad and diversified training programs, including on-the-job training, designed to qualify for employment the many persons who cannot reasonably be expected to secure full-time employment without such training and to equip the Nation's workers with the new and improved skills that are or will be required."

An underlying element in the question of the adequacy of the rural schools is the fact that the measure used has usually been the level of schooling attained by rural people, a level that is determined largely by the desires of the people themselves.

It is reasonable to assume that if rural people as individuals or as a group during the past 50 years had wanted greater educational opportunity—that is, a more adequate school system—it was theirs for the making and taking. Motivation is essential in education: growth is something a person must want for himself.

THE DANGER now, amid the preoccupation for larger administrative units, bigger school buildings, and more classrooms, is that the learning programs and the courses of study in these improved facilities may still not be adequate to prepare young men and women for the new system of life, the technological stage of civilization, in which they must live.

The planning for this adequacy must be a shared responsibility.

The family, the school, the church, and the business community must operate in a frame of mind prepared for change—change of residence, jobs, details in a particular job, and in community relationships. This will require a recognition of growing urbanization and the need for preparation for life in that environment. Schoolchildren as well as adults should have an understanding of our society and our economy.

The population of the United States may increase 18.7 percent from 1960 to 1970. This increase and expected increases in the numbers who seek education at the different levels justify projections for the same 10-year period of 20 percent greater enrollment in the first 12 grades, with 50 percent more completing high school; and double the number of college graduates, with even greater increases in postgraduate institutions.

More people to educate will certainly require more school plants, more classrooms, and more teachers, but they will not in themselves improve the adequacy of the education provided for the youth of the country.

It is the qualitative considerations that will make the difference. In the last analysis, the attitude of understanding, appreciation, and wanting education on the part of the parents and general populace that will bring the necessary high quality into reality.

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